**Notes: Mike Marin**

**B08704017-國企三-翁朝新**

#1.1

```
x <- 1:5
y <- 6:10
plot(x, y)   #  繪表  # able to export
ls()   #  看宣告了些什麼
# import data set through environment
z <- 11:15
sum(x, y, z)   #  加總
```

#1.3

```
# assign
x = 11
y <- 7
print(x)   #  顯示
rm(y)#  去除物件
#  變數名稱第一個字元不能是數字
xx <- 'marin'   #  宣告文字
xx
11 + 14
11^2
sqrt(x)   #  開根號
abs(x)   #  絕對值
log2(x)   # 2 為底的 log 值
```

#1.4

```
x1 <- c(1,3,5,7,9)   # concatenate
2:7
seq(from=1, to=7, by=1)   #數列
rep(1, times=10)   #  重複
x <- 1:5
y <- c(1,3,5,7,9)
#  若兩個 vector 長度相同可以直接四則運算
#  擷取元素
y[3]
y[-3]
y[c(1,5)]
```

```
y[y<6]
#  矩陣
mat <- matrix(c(1:9), nrow = 3, ncol = 3, byrow = TRUE)
mat
mat[1,2]
mat[c(1,3),2]
mat[2,]
mat[,1]
mat*10

#1.5
# import data from excel .csv or .txt
#  取得指令說明
help("read.csv")
?read.csv
# .csv 的檔案
data1 <- read.csv(file.choose(), header = TRUE)
# file.choose()執行後會跳出可以選擇檔案的選單
# header = TRUE 代表資料的第一 row 為標題
data1
data2 <- read.table(file.choose(), header = T, sep = ",")
data2
# .txt 的檔案
data3 <- read.delim(file.choose(), header = T)
data3
data4 <- read.table(file.cgoose(), header = T, sep = "\t")
data4

# 1.5b
#  讀入 excel 資料，用選的或用程式碼
# file -> import data set -> from excel
library(readxl)
aa <- read_excel('檔案位置', sheet = 'aa', col_types = c('numeric'), na = '***')
View(aa)

# 1.6
#  輸出資料
write.table(DataToExport, file = '輸出位置/檔名.csv', row.names = F, sep = ',')
```

```
write.csv(DataToExport, file = '輸出位置/檔名.csv', row.names = F)
# .csv 不用 sep

# 1.7
help(read.table)
?read.table
Data1 <- read.table(file = '', header = T, sep = '\t')
# header：第一列是不是變數
Data2 <- read.table(file.choose(), header = T, sep = '\t')
#  用選的
# Rstudio 可以從環境中直接讀入
rm(Data1)    #  清掉 data
dim(Data1) #  看有幾 row 幾 column
head(Data1) #  看前六 row
tail(Data1) #  看後六 row
Data[c(5,6,7,8), ]
names(Data1) #  看行名稱

# 1.8
names(Data1)
# extract variables
Data1$Age # $要提取的變數名稱
attach(Data1)
#  把變數存入 R
detach(Data1)
class() #  看資料類型
levels() #  看 factor 類型的資料
summary() #
#  用 0, 1 代表 no, yes
x <- c(0,1,1,1,0,0,0,0,0)
class(x) # numeric
summary(x)
x <- as.factor(x)
class(x)
summary(x)
```

```
# 1.9
dim(Data1)
length(Age) #  看長度、有幾筆資料
Age[11:14]
Data1[11:14, ]
mean(Age[Geneder == 'female'])
#  看女生的平均年齡
FemData <- Data1[Gender == 'female', ]
#  創造儲存女生年齡的新資料
summary(FemData)
MaleOver15 <- Data1[Gender == 'Male' & Age > 15, ]
#  創造儲存大於十五歲的男性的資料

# 1.10
Age[1:5]
temp <- Age > 15
temp[1:5]
# FALSE T T F F
temp2 <- as.numeric(Age > 15)
temp2[1:5]
# 0 1 1 0 0
FemSmoke <- Gender == 'Female' & Smoke == 'yes'
FemSmoke[1:5]
# FALSE T F F F
MoreData <- cbind(Data1, FemSmoke)
#  把 FemSmoke 結合 Data1
MoreData[1:5]
rm(list = ls())
#  把 workspace 清空

# 1.11
# setting up working directory
getwd()
setwd('path')
projectWD <- '想要更改的路徑'
setwd(projectWD)
# session -> set working directory -> choose working directory
```

```
MeanAge <- mean(Age)
x <- c(1,2,3,4,5)
y <- -14
z <- summary(Data1)
save.image('檔名.Rdata',)
#  會存成 work space image file 到 working directory
# session -> save work space as
rm(list = ls())
# session -> clear work space
q()
# quit Rstudio
load('檔名.Rdata')
#  載入先前存的 work space
load(file.choose())
# session -> load work space

# 1.12
# writing script
# R script needs to be stored with .R
class(Gender)
# TAB 可以選擇指令

# 1.13
# installing packages
help(install.packages)
install.packages() #  可用清單
install.packages('epiR')
library('epiR')
help(package = 'epiR')
remove.packages('epiR')

# 1.14
# customizing R studio
```